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ABSTRACT

This document contains all of the articles from an "Education Week" special report examining technology's role in bringing schools and homes closer together. Articles include: (1) "Homeward Bound" (Peter West), about one of the nation's first "virtual teachers" and the effect of the changing dynamics of the telecommunications industry on electronic classrooms; (2) "Nerve Center" (Peter West), which details the successes and drawbacks of the Indian River Education Network (IRENE), an electronic bulletin board that allows a Florida community to gain access to school-related schedules, meeting minutes, and other information; (3) "Computer Geeks" (Peter West), outlining the increasing prevalence of computers and electronic information in the classroom; (4) "Home on the Web" (Peter West), about parent teacher association home pages on the world wide web and other ways of using the Internet to enhance communication between the school and the home; (5) "Home Improvement" (Megan Drennan), about a project whereby Bell Atlantic gave 135 inner-city seventh-graders at Christopher Columbus Middle School (Union City, New Jersey) their own home computers in order to gauge the effects of easy computer access on motivation, academic performance, and family awareness of school activities; (6) "Making It Work" (Peter West), about an entire precollegiate curriculum available online worldwide; and (7) "Equitable Pursuits" (Peter West), about a project which provides the disadvantaged with electronic links to community services and economic opportunities. (BEW)

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MAKING THE CONNECTION

An *Education Week* Special Report

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This disk contains all of the articles and charts from Education Week's special report "Making the Connection," which was published January 10, 1996. This report examines technology's role in bringing schools and homes closer together.

The special report was made possible by a grant from the Pew Charitable Trusts.

MAKING THE CONNECTION

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More and more educators, policymakers, and telecommunications companies are investigating how technology can help break down the barriers that too often separate schools from homes and teachers from parents.

NERVE CENTER (file name is 02irene)

The Indian River Education Network--an electronic bulletin board called IRENE for short--puts school news right at the fingertips of students, parents, and teachers.

COMPUTER GEEKS (file name is 03savvy)

As a new generation of computer-savvy students reports to school, teachers take stock of how those sophisticated skills will change how and what they teach in the classroom.

HOME ON THE WEB (file name is 04web)

Parents are beginning to use the Internet's World Wide Web to provide and access timely information about schools.

HOME IMPROVEMENT (file name is 05union)

In the largely poor and Hispanic Union City, N.J., district, test scores are rising, attendance is up, and an educational renaissance is under way. An effort to provide families with home computers gets much of the credit.

MAKING IT WORK (file name is 06link)

Linking schools to homes opens up all sorts of possibilities. But it also presents many technical, logistical, and human problems.

EQUITABLE PURSUITS (file name is 07urban)

The Urban Technology Center hopes to make its brand of computers as affordable to inner-city residents as TV sets.

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Volume 15, Issue 16, January 10, 1996

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Homeward Bound

By Peter West

Alan Griffin is one of the nation's first ``virtual teachers.'' From his desk at the administrative offices of the Weber school district in the suburbs of Ogden, Utah, he can monitor the 40 junior high school students enrolled in his world civilizations course simply by turning to his computer screen.

There, on a district-run electronic bulletin board, students discuss assignments on line, retrieve course outlines and other information, and question their teacher via electronic mail, all from their homes.

They tap out their messages on personal computers at home or in the school district's media center. Those messages speed through their modems along regular telephone lines to a PC dedicated to running this on-line course. The software then sorts out their messages and allows Griffin to answer their questions and conduct class discussions.

The students are not required to--indeed cannot--attend the class in the generally accepted sense of the word. But to give them a chance to meet ``this living, breathing entity who's on the other end of the computer,'' Griffin arranges occasional field trips, such as one to an exhibit on ancient China at nearby Brigham Young University.

Griffin's course, which he is piloting this year, is testing the limitations and potential--both technological and human--of the so-called information highway.

If it is a success, the experiment may give the district one way to expand the physical boundaries of school and more efficiently schedule the use of brick-and-mortar classrooms in the face of booming student enrollments. In each of the last 12 years, the

Weber district's student body has grown by roughly 1.5 percent, almost 500 students this year alone. Little state money has been available for building new classrooms.

Few communities are willing, even fewer schools are sufficiently equipped, and only a handful of educators are prepared to implement the equivalent of telecommuting for grade-school children.

But a growing number of educators, politicians, and technology companies are investigating whether computers and modems, cable television, or even a simple telephone voice-mail system can break through the geographic and psychological boundaries that too often separate schools from homes and educators from parents.

Educators have long known that students learn more when their parents are involved in their education. Reformers often cite the link between increased parent involvement and improved student performance in arguing that schools should do more to reach out to the communities they serve. The kinds of efforts discussed in this report to link homes and schools electronically take their cue from this philosophical base, though some blend equal parts idealism and the urge for commercial success.

No one argues that technology alone can turn around a failing school system or create academic achievers out of mediocre students. But the ability of technology to provide both instantaneous worldwide communication and information on demand has caught the eye of policymakers at the national, state, and local levels as one way to tackle a number of education ills.

U.S. Secretary of Education Richard W. Riley, as part of his overall strategy for increasing parent involvement, advocates the use of technologies to bridge the gap between school and community.An upcoming report from the U.S. Department of Education called ``Connecting Classrooms, Computers, and Communities: Teaching and Learning in the Digital Age" stresses the importance of such links.

The department also has funded several pilot projects, from rural Indiana to Laguna Pueblo in New Mexico, through its new Technology Challenge Grants program.

``Learning in school has to be supported by learning at home and learning that goes on after the school doors are closed," says

Linda G. Roberts, Riley's technology adviser. ``We literally want to expand the time for learning, and I think that's the real key here."

The Clinton administration--which has invested a great deal of political capital in the notion that the information highway can foster the development of ``virtual communities"--also has supported several pilot projects through grants from the Department of Commerce.

At the state and local levels, efforts to bridge the gap between home and school frequently are driven more by pragmatism.

In Utah, Gov. Michael Leavitt has encouraged school districts to experiment with alternatives to new construction to accommodate one of the nation's fastest-growing student populations.

``We can't build our way out of the difficulties that we are in," says LaVarr Webb, a policy aide to Leavitt. ``The governor is pushing really hard to look at technology as a means to be able to at least slow the growth" of school-construction budgets.

One fast-growing Utah school district, he notes, plans to build a ``school of the future" in which a third of the student body would telecommute at least part of the day from home, local libraries, or community centers.

But Webb concedes that technological fixes do have their limits. Not every household has a parent at home to monitor children's progress and not every student is sufficiently self-motivated to succeed in such a course.

Alan Griffin himself doesn't foresee the dawn of a complete ``virtual school."

``I don't see this program replacing what we have in the public schools," he stresses. ``What this does is provide alternatives for some students."

If Griffin's social-studies class proves a success, the Weber district may expand the program to other classes, says Assistant Superintendent Tim Chatelain. But the district is determined to keep its focus on technology as a means to deliver curriculum, not as an end in itself.

For obvious reasons, the idea of linking home and school is attractive to companies that sell technology.

Apple Computer, which launched its 10-year-old Apple Classrooms of Tomorrow research project with a strong home technology component, is considered the ``grand daddy of them all," notes Cheryl S. Williams, who oversees technology programs for the National School Boards Association.

But financially troubled Apple later dropped the home component, citing, among other reasons, the difficulty of keeping equipment current. The Cupertino, Calif.-based computer maker, however, recently held two national seminars highlighting the importance of ensuring compatibility between home and school educational software and computers.

In a speech last month at Georgetown University, meanwhile, the chairman of Microsoft Corp. said that the growing numbers of personal computers in American homes provide an unprecedented opportunity to create two-way electronic gateways between the classroom and the living room.

In outlining his vision of the ``connected learning community," William H. Gates III said that Microsoft will give every school in the nation software to develop electronic mail and other services to communicate with other schools. The program, which works with the networked version of the company's Windows software, can also be used to build links to homes, such community resources as museums, and the Internet.

IBM, meanwhile, announced last month that the final $2 million grant in its Reinventing Education program would go to the Cincinnati public schools, which will use the money to extend and restructure the school day and instructional year. Links to the home are likely to be one element of the program, as they are in the Charlotte-Mecklenburg, N.C., schools, where the first of the 10 IBM grants was awarded in 1994. IBM gives the grants to districts that want to use technology to aid reform.

The nation's telecommunications industry looks at the idea of linking the home and classroom and sees dollar signs. From Carollton, Ga., to Union City, N.J., cable-television and telephone companies are testing ways in which advanced telecommunications networks capable of carrying voice, video, and computer data can make that connection a reality.

Critics see these trial programs as the industry simply positioning itself to reap enormous profits should Congress agree on a plan to rewrite the 50-year-old law that regulates the telephone and related industries. For example, the law currently bars telephone companies from entering the cable-television market and prevents cable companies from offering telephone service. The industry argues that new technologies make these restrictions obsolete. In a deregulated environment, industry lobbyists contend, new services would mean expanded revenues, some of which could be used to underwrite the costs of providing educational services to schools.

A deregulation bill passed by the Senate would require companies to offer schools services at affordable rates; the House bill has no such requirement. A House-Senate conference committee will resolve the issue.

Geoffrey Fletcher, an associate commissioner with the Texas Education Agency, says that deregulation of the kind now being considered could radically change the nature of schooling.

Today, Fletcher says, there is no economic incentive for companies to develop innovative curriculum products that can be delivered to both home and school simultaneously. For example, instead of spending money to print textbooks that rapidly become outdated, textbook firms should discuss with telecommunications providers methods for delivering curriculum and reference works when they are needed to both homes and schools electronically.

``People should think about the education market and the textbook market as more than just `the book to the student in the school,' " he adds. ``It may be that a textbook publisher says, `Here's our information, but we're not going to print it; we're just going to put it on line.' "

Fletcher notes that Texas gives its school districts roughly as much on a per-pupil basis to buy technology as to buy textbooks. And a separate state fund, which contains money provided by local telecommunications firms, contains $150 million to help wire schools.

These funds, taken together, could pay for some meaningful experiments to provide courses on demand through small set-top boxes--akin to the familiar cable converter boxes--that would turn television sets into the equivalent of computers.

``Unfortunately, the telecommunications industry in general is just not used to dealing with education," he adds. ``It's real tough for companies to envision this because they have to look quarter to quarter and year to year, and this is not going to turn a profit overnight."

The kinds of home-school connections Fletcher describes are probably several years in the future. Not only do schools lack up-to-date technology, but there are vast disparities in technology ownership in America.

``That's the crux of the issue; How do you equip everybody and make sure everybody's equipped in the proper way?" asks Cheryl Williams of the NSBA.

Roberts of the Education Department suggests that lending computers to students or making them available in libraries and community centers are possibilities. And other ideas have been touted. Because nearly every American home has a television set, the set-top box was once promoted as the solution for delivering curriculum outside the classroom. Today, a leading proponent of the idea admits that the cost of the high-end set-top boxes, at between $1,000 and $1,500 each, and the slow development of the high-speed communications lines needed to deliver an interactive curriculum make the venture too expensive, at least for the immediate future.

``The economics basically are not there right now," says Stacey Sultar, a spokeswoman for the Lightspan Partnership, of Carlsbad, Calif. Lightspan was founded to help close the technology equity gap and to extend the school environment into students' homes. Its method was to develop sound curriculum and persuade telecommunications companies to provide it free to schools. The idea was that the companies would be so eager to capture the home market that they would gladly make such a deal.

Today, Sultar concedes, the idea of delivering curriculum over cable-television and telephone lines is ``looking more complex than the industry originally thought."

Meanwhile, the coursework at Lightspan's 16 pilot projects nationwide still is delivered on CD-ROM, though Lightspan is considering using video game players as a relatively inexpensive alternative. The company also is investigating using the Internet as a communications link with the home to enhance the CD-ROM-based curriculum.

The difficulties inherent in getting schools and homes connected to the latest equipment have led some experts to conclude that more mundane technologies are often the most successful in getting parents involved.

Since the late 1980s, Jerold P. Bauch of Vanderbilt University's Peabody College has been perfecting his ``transparent school" model, in which parents and teachers communicate by telephone. Bauch reasons that 95 percent of homes in the United States have access to telephones, giving that humble technology a reach far greater than that of the personal computer, which is in just over 30 percent of American homes. ``There is an equity issue with jumping too fast into these high-end technologies," he says.

Today, using a top-of-the-line voice-mail system, parents and teachers at schools using Bauch's idea share information at their convenience, 24 hours a day. As a bonus, the systems, which at $15,000 cost far less than a computer network, frequently have sufficient capacity to store messages in more than one language.

Voice mail, he adds, would complement more sophisticated technologies as they become available.

The idea is so straightforward, and yet its results so well demonstrated, that the American Business Collaboration for Quality Dependent Care, a coalition of some of the nation's largest industries, plans to spend $1.4 million to equip 102 schools in 11 communities nationwide with the voice-mail systems and Bauch's technical support.

Corporations rely on voice mail ``as the bread and butter of their business," says Leanne Barett, of Work/Family Directions, a consulting firm that helped the coalition develop the project. Thus, corporate executives understand the value of the system to help reduce the stress and absenteeism that result when employees have to deal with problems at their children's schools.

But technological innovation alone cannot create a learning community.

"You can screw up any innovation," Bauch says. ``It has to be embedded in the school culture that `this is the routine way that we communicate with the broader body of parents.' "

One effort to embed technology in the school culture is that of the Edison Project, a chain of for-profit private schools. In a nod to the realities of the modern workday, Edison schools equip every student and teacher with a home computer to provide more time for learning. Deborah McGriff, Edison's senior vice president, notes that the New York-based company, which opened its first four schools this year, schedules a seven-hour school day and is in session for 206 instructional days to meet that goal. But, she adds, ``we also know that having computers in the home extends the day even more."

Edison schools encourage students, parents, and teachers to use the home computer to continue work on student projects stored on the school's central computer. Busy parents can also use the computer to keep in touch with one another and with their children 24 hours a day both locally and nationwide.

``It's an issue of being responsive to the current lifestyle of parents," McGriff says.

Most schools, however, have done little to help parents become technologically literate. As a result, they are unlikely to support technology programs that go beyond basic instruction, notes Manina Dunn, an assistant dean at Seton Hall University's

College of Education and Human Services who served on the New Jersey Department of Education's task force on long-range technology plans.

She says parents in West Orange Township, N.J., where she serves on the local PTA, probably won't back plans to link schools with the outside world with technology because most of them don't use e-mail, the Internet, or other technologies at work.

As a result, ``when technology is introduced, it's the students and teachers who benefit," she says in an e-mail message. ``State long-range technology plans include teacher training and student learning in their goals. None that I have seen include parents, a serious omission."

And, notes Anne Gold, the principal of Lansdowne Elementary School, a Lightspan pilot school in a blue-collar suburb of Baltimore, while the Lightspan curriculum is compelling and effective in motivating students, parents are free to ignore programs that might help their children learn. ``Parent involvement is not a strength here," she says. ``Even when the program is free."

Some observers also note that before adopting technological quick fixes, educators should consider the human dimensions of fostering meaningful connections with parents.

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Nerve Center

By Peter West

The wet blanket of tropical air carries the threat of an off-shore hurricane as Michael Kint ushers a visitor into the converted church that serves as the headquarters of Vetrol Data Systems. Sitting behind a desk, lights blinking and wires curling and spiraling to the floor, IRENE sits patiently, waiting for rush hour on the information highway.

About 30 minutes after school lets out, the telephones start ringing, followed by the electronic squawk of modems, as students across Indian River County gear up to engage in electronic chat sessions. From the keyboards of their home computers, some tap out messages about schoolwork, some about boyfriends and girlfriends, and some just ``lurk" and listen.

IRENE, or the Indian River Education Network, is an electronic bulletin board system that since 1992 has allowed students, teachers, and parents in this Atlantic coastal town to use their home computers to retrieve bus schedules, read the agendas of school board meetings, and collect class schedules posted on the system.

But officials say that what IRENE is today is just a shadow of what she'll be in the months and years ahead, thanks to a grant from the federal government. In fact, IRENE's capabilities literally grow by the day, as new high-speed modems are added to the system, a user-friendly graphical interface is grafted onto the network, electronic-mail capabilities are beefed up, and the local system gets tied into the Internet. The improvements are all aimed at making what local administrators call the ``Indian River idea" a reality.

``We really view this as an information utility for the community," says Kint, the director of the federal grant that

supports IRENE via a server maintained here at Vetrol. ``It would be great if everyone used it every day."

By harnessing such technologies as e-mail, Internet search engines, and even cable television, educators predict that IRENE will one day become a bridge between the classroom and the greater community. As such, the electronic bulletin board will help link schools, homes, local government, and social-service agencies.

District administrators also hope IRENE will dramatically expand the temporal limits of the school day.

As part of a pilot project at Highlands Elementary School, for example, consultant Jackson K. McAfee and a team of teachers are developing a system to create individual learning plans for students that would tell parents exactly what it is their children should be concentrating on to succeed in school. And e-mail makes it easier for teachers to stay in touch with parents about everything from homework assignments to concerns about student performance.

McAfee, the district's former director of information services, says eventually teachers will be able to load the learning plans onto IRENE for ready access any time of the day or night. What's more, students will be able to log on, monitor their academic progress against their own personalized plan, and find the resources they need to complete their school assignments.

As part of the project, an inventory of educational resources on the Internet specifically appropriate to the district's curriculum is also under development. ``Think of how much better that is than just having kids roam around and find out what's out there on their own," McAfee says.

Moreover, because IRENE allows every school in the district to communicate with each other and with the school system's central administration via e-mail, teachers could share exemplary lesson plans at will.

``We know that good teachers have good lesson plans," McAfee says. ``With IRENE, we can make that knowledge available to everyone in the county."

Agricultural Roots

Vero Beach sits on Florida's ``Space Coast," about an hour south of Cape Canaveral; close enough that residents can clearly hear the nearby roar of orbit-bound space shuttles.

The local newspaper operates a sophisticated home page on the Internet's World Wide Web that offers glimpses of everything from local entertainment listings to census figures. But Indian River County itself, as IRENE's developers note, is an agricultural mecca in the heart of the nation's citrus-producing region. Not far from the neatly laid-out streets of Vero Beach proper, sometimes just a block away from the city line, drivers emerge into a grid of north-south avenues and east-west streets that serve as the boundaries for hundreds of thousands of acres of orange and grapefruit groves.

The agricultural roots make IRENE and its connection to the Internet a lifeline to educational resources that locals didn't even dream of a generation ago. ``This is a rural county," McAfee notes. ``There's no major research university for miles around."

But IRENE and the Internet bring the world to residents' living rooms and open the borders of Indian River County to the globe. On a recent visit to a cafe in Oslo, Norway, a local businessman found out just how small the ``global village" is becoming. ``The owner had set up some computers, so I SAT down and logged onto IRENE," says Peter G. Robinson, who heads up the Indian River Education Foundation, a community group set up to provide computers to underprivileged students. ``I thought that was really great."

The Indian River idea might have remained largely an unfulfilled dream had the district not received a grant from the U.S. Department of Commerce as part of a program aimed at developing what the Clinton administration has dubbed the National Information Infrastructure.

Vice President Gore, in a January 1994 speech to representatives of the telecommunications industry, made explicit the administration's challenge to cable-television, telephone, cellular, and other communications companies to connect every classroom to advanced telecommunications. He spoke of the administration's belief that telecommunications can ``give every

American, young and old, the chance for the best education available to anyone, anywhere."

Both Gore and President Clinton have stressed that the responsibility for building and deploying the NII lies with the private sector. But the administration has mounted several pilot programs to make more explicit the promise of technology.

Funding for IRENE came from the department's National Information and Telecommunications Administration through its Telecommunications and Information Infrastructure Assistance Program. The first round of TIIAP grants, which were awarded in the fall of 1994, attracted more than 1,070 applications from 50 states, the District of Columbia, and the U.S. territories. The grant requests totaled more than $560 million.

In the end, the TIIAP awarded a total of $24.4 million to 92 projects in 45 states, the District of Columbia, and the U.S. Virgin Islands and generated more than $43 million in matching funds.

In Indian River County, the $185,000 grant, one of the only grants made in the initial round to a Florida district, has allowed a more rapid expansion of IRENE than anyone here envisioned.

In addition to technological upgrades to IRENE, other recent developments include:

* The district has placed public-access computer terminals in county libraries to allow users to log on to IRENE. The public library's card catalog will also be available on-line so patrons will be able to browse the stacks electronically at their leisure.

* Two teachers, with the help of their students, have produced a 30-minute videotape presentation that introduces users to the basic concepts of how to use IRENE and the advantages of telecomputing. The program has aired on the local cable-television access channel and is expected to be the first in a series of educational programs about IRENE, the Internet, and related topics.

* The district offered poor minority middle school students the chance to enroll in a pilot on-line math course. Students

received a basic background in telecomputing and loaner computers, courtesy of local businesses, for the calendar year so they could access IRENE and communicate by e-mail. Alumni members of Alpha Kappa Alpha national sorority who live in the area have volunteered as mentors for students in the program.

* In cooperation with community organizations, the local cable-television franchise, and the local hospital, the district has organized several town meetings to introduce the community to IRENE.

Reality Check

Strong doses of reality have, nonetheless, tempered IRENE's successes. One issue to rear its head is how to ensure equitable access to the network among the largest group of students possible--regardless of family income or socioeconomic status.

Although common library terminals do provide one means of public access, Robinson from the Indian River Education Foundation is encouraging local businesses to offer services and equipment to students to help close the equity gap. ``We're considering asking them to take an elementary school and give every 5th grader a computer,'' he says. ``Their contributions wouldn't necessarily be monetary; it could be to donate computers.''

Far more seriously, the district learned in November that it would not receive a second Commerce Department grant to expand IRENE's capabilities to deliver multimedia curriculum materials into schools and homes.

Using such a system, students could access their individual learning plans from IRENE and then track down reference materials they needed to complete the assignment on-line from local media centers and the Internet. At Sebastian River High School, for example, a state-of-the-art center that opened less than two years ago allows students to go to the library and retrieve a variety of information from a bank of computer terminals loaded with CD-ROM-based software and Internet connections. But the hope was to deliver those resources into students' homes via cable-television lines through a partnership with neighboring St. Lucie County.

``Not everyone has a computer,'' Robinson says. ``But almost everyone has cable television and a VCR.''

But without more federal funding, such plans are on hold indefinitely. Kint, who directed the project under the first-round grant, has taken another job with a local community agency. ``There are just no resources available right now to pursue this," says district spokeswoman Linda Kern.

But despite the funding setbacks and an uncertain future, IRENE still offers a valuable service to area students, both past and present.

Wendy Lee, a former Indian River County student who's now a sophomore at Dartmouth College, uses IRENE through a university Internet link to keep in touch with family and friends back home. The prospective special-education teacher noted in an e-mail correspondence that she's also a ``keypal" with students at Citrus Elementary School. ``It's interesting to hear from younger children," she wrote. ``And I think it is good for them to hear a bit about college."

IRENE, she adds, ``first introduced me to the world of telecommunications."

The resources mentioned in this story can be reached at the following Internet addresses:
IRENE: http://www.vetrol.com /irc/home.html;
NTIA: http://www.doc.gov/resources/csd/csntia.html.

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Computer Geeks

By Peter West

Books, pencils, and paper litter the desks in Margo Toering's 6th-grade class here at Timothy Ball Elementary School. But when her students finished their class projects on whales at the end of the semester, they didn't hand her a folder full of loose-leaf sheets.

Instead, they turned over computer diskettes that held ``multimedia presentations" combining graphics, sound, and text--reports they prepared on home computers or on the machines that line the periphery of the classroom.

Toering's students handle a keyboard as easily as most students wield a pencil. That's because for the past two years each of them has worked at home on a personal computer provided by the Buddy System Project, a cooperative venture between state government and businesses that has equipped thousands of elementary students across the state with home computers.

Looking on as a student-teacher conducts her class, Toering wonders aloud what effect this aptitude for technology will have on the school system as her students advance toward graduation.

``What they're learning here will carry on to junior high school and high school," she notes. ``That's what's amazing to me."

Like Toering, others in the Crown Point School Corp. are wondering just how the new technology ultimately will change their lives. Like their counterparts elsewhere, educators here have long assumed they knew the kinds of basic skills that students would need to go on to higher education or the workplace. And they worked hard to provide those skills.

But the Buddy System has changed all that. And two years into the project, the folks in Crown Point are beginning to see that education may never be the same again.

``The children are becoming so sophisticated on the computer that they're assisting the teachers," says Brooke Regnier, who serves on the Buddy board and whose daughter is enrolled in the program.

Thus, the school board must soon take up the issue of how to upgrade the skills of teachers who daily must deal with some 850 technologically savvy students.

Board members will also have to decide what in the curriculum must stay and what must go as a result of almost universal access to computers. For example, they may deem that cursive writing, long a staple of the elementary curriculum, is no longer necessary. At the high school level, typing class may be passé,. since students will have long since mastered the computer keyboard. And some teachers are unsure whether print references and textbooks will be needed in classrooms that have access to on-line resources and electronic encyclopedias.

Parents of children in private and parochial schools, meanwhile, have begun to ask the district what skills their children will need to have mastered should they transfer into public high schools.

Born seven years ago in Indianapolis as a modest local initiative to equip 500 students in two schools with home computers, the Buddy project's annual budget is now in the range of $6 million, most of which is spent on equipment and software. Last year alone, the project installed computers in about 6,000 homes from one end of Indiana to the other.

The project, run by the nonprofit Corporation for Educational Technology, is supported by the state legislature and such corporate and philanthropic partners as the Lilly Endowment, the Ameritech Corp., GTE, and the Muncie, Ind.-based George and Frances Ball Foundation.

Individual schools or entire districts may apply to be Buddy sites. To be chosen for the project, sites must be innovative and willing to enhance the state's contribution of $900 per student sufficiently to provide each student with a computer, modem, and printer at home.

Buddy students receive their computers in the 4th grade and keep them until they enter 6th grade. Project officials say 4th grade is the ideal time to introduce computers. Boys and girls at that grade level, they say, are still equally receptive to technology and have received homework. Bonds between parents and children are typically still strong at that age and parents generally are able to cope with 4th-grade homework assignments.

Teacher Training

Technology experts nationwide consider the Buddy Project a leading model for linking schools and homes by computer.

But Al Hill, the executive director of the Corporation for Educational Technology, notes that the effort has endured its share of difficulties.

Lack of teacher training is one. Less than 30 percent of the project's budget statewide has been devoted to staff training, which has kept teachers from fully integrating technology into their curricula or being able to help parents with the hardware at home.

``Our experience has shown that it takes five to six or seven years to fully integrate the technology," Hill says. ``And that is simply asking more than the typical teacher is either willing or capable of supporting" without additional training.

The project is developing materials that will enable parents themselves to take a more active role in helping their children use the computer in their schoolwork, thereby relieving some of the burden on teachers.

Toering, who coordinates the Buddy System project at Timothy Ball Elementary, agrees that teachers, particularly older ones, did not immediately embrace the computers when they arrived two years ago. But, she says, those fears mostly have abated because teachers now see the machines as integral to instruction, rather than as an add-on.

Another difficulty has been convincing state lawmakers, who generally have supported the program, that it is beneficial to students. ``We're being asked on a regular basis 'Have math scores improved?' " Hill says.

That, he says, is the wrong question. ``We don't ask if chalk improves standardized test scores or if pencils improve standardized test scores."

No one, meanwhile, argues that test scores have deteriorated as a result of the program, only that access to technology alone has not produced any sizable improvement.

Many of the lawmakers who fund the project don't recognize developing the ability to use computers to search on-line services and databases and to communicate with others electronically as an important educational objective.

But ``the business community is requiring that young people have those kind of skills," Hill says. ``What the Buddy System does is equip children with a whole set of resources that will make their entire formal education far more productive and enriching."

Satisfied Customers

You won't get much of an argument on that score from Jim or Esther Lambert, whose sons Jeff and Kevin are students at Timothy Ball Elementary.

Grouped around the family computer in the guest room, watching Kevin peck away at the keyboard, Jim notes that both his young sons can now use electronic mail, compile computerized term papers, and peruse software-based reference works, a repertoire of skills that will serve them well in the job market.

Kevin is laboriously composing a message to his 4th-grade teacher, Julie Gasparovich, which he will deposit in her private mailbox. He explains that one way his teacher encourages the class to use the system is by posting a ``word of the day" on an electronic bulletin board. Students must then use the word in a sentence and send the sentence to her personal e-mail box. As a reward, he notes with a sly grin, she presents them with a piece of candy the next day. The teacher also posts lists of science vocabulary words on the bulletin board along with daily homework assignments so that parents can ensure the work gets done.

Because the district places no restrictions on how the computer may be used, other family members get in on the action. Jim, a special-education teacher, often uses the machine to communicate

with colleagues in the district. He also does word processing and records class grades on a spreadsheet program.

A Changing Community

Even before the advent of the Buddy project, Crown Point was a community in transition.

Along state Route 231, a main artery leading into town from Interstate 65, new houses are going up that can only be described as sumptuous. The houses, locals say, are being built for commuters eager to escape the urban problems of Chicago, an hour's drive away.

Yet, only a few minutes' drive further west on the same road, the local feed store still appears to be doing a brisk business, testimony to the agricultural roots that slowly are being cut.

In the town square, the Old Lake County Courthouse--a red brick artifact of the 1880s that is listed on the National Register of Historic Places--no longer dispenses justice, but candy, knickknacks, and Christmas ornaments from several gift shops and boutiques.

And across from the courthouse, sandwiched between the Island Restaurant and the defunct People's Bank, a banner slung on the front of Instant Access, a computer store, advertises accounts on the Internet.

The school corporation applied for the Buddy Project precisely to help prepare its students for this world in transition. So community support for the program is strong, says Jeff Iacobazzi, the executive assistant to the district's superintendent.

He points to the example of a local family-owned bank that has stepped in, with a little encouragement from the district, to address the issue of how to provide former Buddy students with computers once they enter 6th grade.

Carol Highsmith, the spokeswoman for Centier Bank and herself a Buddy parent, explained that it has set up two programs, though with little response so far. Families can set aside money in a savings account, beginning when the children enter 4th grade, and collect the savings two years later to buy a computer. The bank also has established a low-interest loan program to allow parents

to buy machines.

``Our focus is to be very active in the communities we serve," Highsmith says. ``We thought this was a good way of helping the family provide educational tools for their kids."

Supporters also stress that the Buddy System is having a wider benefit than just providing students with computers.

Several Buddy parents, Toering notes, have been able to get new jobs thanks in part to computer skills they acquired while working alongside their children. In fact, she notes, parents are often the most eager members of the family to get the computers.

``The parents are thirsty to learn enough to keep up with their kids," she says. ``A lot of them can't believe that we're going to give them a computer for two years."

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Home on the Web

By Peter West

As the Texas legislature haggled last spring over a sweeping reform of the state's education laws, every comma and clause of the proposed legislation was distributed to homes across the Lone Star State on the Internet, courtesy of the 800,000 members of the state PTA.

Using computer services donated by Onramp Access Inc., an Austin-based provider of Internet services, the PTA created its own home page on the World Wide Web containing drafts of the bill and other information for parents.

The Internet gives one of the nation's largest PTA chapters a direct electronic link to the homes of many members, says Bill Cox, one of the organization's directors and its technology consultant.

``We wanted to have a quick vehicle to get the information out," he says, ``and we discovered that quite a few people had Internet access through one of the commercial services like America Online or Prodigy."

Many parents also are tied into the Texas Education Network, a state-run service that provides educators and students with Internet access for a $5 annual fee. ``Quite a few families have accounts in their childrens' names," Cox notes.

The home page has more than proved its worth by reducing the number of telephone inquiries to the state PTA office. It's also made it easier for parents to discuss education policy.

The Texas PTA's experience is indicative of the ways in which inventive parents are just beginning to use telecommunications to provide timely information about schools directly to the home.

An Unofficial Channel

In some cases, the Internet provides a conduit to deliver information independently of officially sanctioned news. Cox said that while that's less likely at the state level, it is certainly true for many of the 2,700 local PTA affiliates in Texas with their own home pages. ``That's where you definitely get the direct line bypassing the administration and bypassing the formal channels," Cox says.

Joseph Campbell, a father of two students in the Howard County, Md., schools, began using the Internet to provide information the local administration was not, but he now also finds it an excellent way to work with local officials.

A comprehensive review of educational software that he and several other members of the Worthington Elementary School technology committee posted on the Internet, for example, grew out of frustration with perceived bureaucratic lethargy.

When his daughters enrolled at Worthington three years ago, he found many computers but little effective software. To fill that gap, the school's technology committee itself developed a comparative guide to educational products.

``It turned out that the county educational technology office was also working on building up a big list of Macintosh software," Campbell says. ``But because communication was nonexistent, a lot of the parents did not know what was available."

He discovered, however, that officials in the educational technology office were on the Internet and began to have e-mail conversations with them and share ideas, a practice that continues today.

Both Cox and Campbell say the Internet's worldwide reach opens new lines of communications for parents. Cox, a father of two, has exchanged e-mail with a counterpart in Australia, and Campbell discovered that a college friend he had not seen in 10 years had copied the software guide.

Talk of the Town

But not all parents, and certainly not all schools, are ready for the information age, as the developer of Weston, a planned

community in Fort Lauderdale, Fla., has discovered to its chagrin.

Noting that the community has an unusually high percentage of home computers, Arvida, the developer, launched its own home page. The page, called TownTalk, has a section that allows parents to communicate with one another and with schools.

Claudia Troisi, an Arvida vice president and TownTalk's general manager, considers launching TownTalk to be ``one of the greatest things that I have worked on in my career.'' Yet she admits to being disappointed with educators who are afraid of the system or don't understand how to use it and with parents who fail to take advantage of it.

While Arvida has made TownTalk an open system, allowing parents to develop whatever content they choose, Troisi says that they seem to view it as the developer's job to ensure that the information on the network is timely and valuable. The parents' apparent disinterest in shaping the content shows "a fundamental lack of responsibility," she says.

And even though the schools in the development are technologically advanced, teachers and administrators seem only dimly aware of how to use even basic e-mail. Some teachers have even criticized colleagues who are technologically adept.

``Knowing full well that TownTalk was not meant to be a teaching tool--it was designed as a communications tool--I have been told by teachers that 'there are some teachers who are using the computer to teach children, and, quite frankly, we don't approve of it,' " she says.

Local school board members also told her they didn't understand how TownTalk worked when they approved it. If they had, they would not have done so because Arvida did not plan to pay for the system to reach all the schools in Broward County.

Troisi isn't sure that TownTalk will continue at the end of its nine-month trial period. And she has come to believe that American society, particularly the educational system, may not yet be ready to take full advantage of the information highway.

``It is the psychological and the anthropological issues that are at the core of the problem,'' she says. ``Until somebody can

figure out the psychological and sociological issues, we are throwing money away."

The resources mentioned in this story can be reached at the following Internet addresses:
Worthington Elementary School:
http://www.gl.umbc.edu/jemmer1/worthington-ES/; Texas PTA:http://www.onr.com/tPTA.html;
TownTalk: http://arvida.towntalk.com/weston/;
Texas Education Network: http://www.tenet.edu:80/.

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Home Improvement

By Megan Drennan

In the corner of a small, bright room decorated with basketball posters and anatomy charts, a computer printer pumps out a replica of the El Salvadoran flag. As the first band of blue emerges, Luciano Calles beams, smiling at his wife and two sons. ``Play the national anthem now,'' he tells 14-year-old Juan.

``I couldn't imagine it--being able to hear my national anthem on the computer,'' says Calles, who emigrated with his wife from El Salvador in 1980. ``It brought tears to my eyes.''

That was more than three years ago, but the personal computer, with its graphics and audio capabilities, still amazes the Calles family. Their amazement is coupled with a sincere appreciation for the personal computer, which Bell Atlantic Corp. gave Juan in the summer of 1993 as part of an unusual technology trial sponsored by the telecommunications giant.

At the heart of this trial was an experiment to see how inner-city school children would perform if they had access to technology both at home and school. To that end, Bell Atlantic provided all 135 7th graders at the Christopher Columbus Middle School with IBM-compatible PCs.

The project also supplied computers for classrooms and for about 20 teachers and administrators to use at home.

The Union City Interactive Media Trial, as it's called, provides basic software and groupware so that students and their teachers can communicate, research on line, and collaborate in the learning process. The PCs are loaded with Microsoft Works, a word-processing program, Encarta, an electronic encyclopedia, and Lotus Notes, a groupware program that has electronic mail and database capabilities. At school, students can access the

Internet through a local Bell Atlantic server. The software developers donated or loaned their products for the project.

Juan's class, now in 9th grade at Emerson High School, is the only cohort to have computers at home.

Like other families who received computers, the Calleses created a special place in their home for the new addition, converting one of the five rooms in their apartment into a virtual office, complete with two desks, reference books, study lamps, and a phone.

This year, Juan is taking only honors classes and his parents attribute his academic success largely to his technology-rich environment. ``He's not the same student he was two or three years ago," his father says. ``He was indifferent. Now, he is motivated, and his grades show that."

So far, it seems the home-school connection is helping Juan's classmates improve academically, too. Each year, 8th graders in New Jersey take the Early Warning Test, which gauges potential academic weaknesses. Last year, more students in Juan's class at Christopher Columbus Middle School passed the test than in any other district school. The class also got the district's highest mean scores in reading and writing, and the second highest in math.

In addition to the academic benefits, the computer has brought the family closer together, says Calles. Juan and his brother Daniel, a 10th grader, have taught him and his wife, Ana, how to write letters with the word processor, look things up in the multimedia encyclopedia, use e-mail to communicate with teachers, and read Christopher Columbus' on-line parent newsletter.

``The computer is a connection between all of us," Luciano Calles says. ``It's something more I can share with my sons."

Sophisticated Network

The Union City technology trial is also a feasibility study of how cutting-edge telecommunications technology can be brought into the nation's schools and homes. Specifically, Bell Atlantic has been testing a new generation of high-speed telephone lines that transform regular phone lines into ultra-sophisticated conduits capable of delivering voices, images, multimedia, and

Internet access.

These ``modems on steroids" as John Grady, the project's founder, describes them, are similar to a video-on-demand technology that the company is now testing in the Northern Virginia suburbs of Washington. In that trial, families use a keypad to punch in their requests for movies, sports events, and other television programming whenever they wish, 24 hours a day. But instead of connecting multimedia to a television, Grady explains, the Integrated Services Digital Network, or ISDN, in Union City delivers information to a computer. The ISDN also makes it possible for students, parents, and teachers to communicate and access information around the clock.

Whether at home or at school, students can use e-mail or tap into an electronic encyclopedia simply by clicking on one of the colorful icons that appears on their computer screen. At school, youngsters can slip onto the information highway by clicking another icon for the Internet. They cannot, however, cruise cyberspace at random; the system won't allow access to adult-oriented sites on the network.

Building this home-school learning network, and making it cost-effective, has involved considerable trial and error. At various points during the trial, students' homes and the school were rewired to determine which kind of telephone line worked best. The company began installing costly fiber-optic cable--a very thin glass strand capable of carrying massive amounts of information very quickly--but reverted to the more familiar copper wiring because of the expense.

``One of our objectives is to find an affordable product," says Kathleen E. Tully, the education manager for Bell Atlantic New Jersey. ``If you want to sell something to a school district, you want to make sure it's worthwhile for them to spend their precious dollars on."

Another objective, one the company does not explicitly state, is to make the case on Capitol Hill that legislators should deregulate the telecommunications industry. A bill Congress is now considering would do just that, creating more competition between telephone, cable, and other industries, and freeing companies like Bell Atlantic to seek different markets for new services. Telecommunications companies contend they need deregulation to make it cost-effective for them to provide

services to schools.

Originally slated as a two-year project, the trial has been extended through 1997. The extension will allow Union City educators to monitor the results of Juan Calles' class through the 10th grade as well as expand the project to other schools.

Educational Turnaround

Union City looks across the Hudson River toward the Empire State Building in downtown Manhattan. More than 87,000 residents are packed into its 1.4 square miles, making it the nation's most densely populated city. A predominantly Hispanic, blue-collar city, many residents are recent immigrants from countries like the Dominican Republic or El Salvador. More than 75 percent of the district's students qualify for free or reduced-price lunches. But in spite of the poverty, the streets are neat, pedestrians are jovial, and many of the row houses sport colorful flower boxes.

``You look around, and you won't see any graffiti or broken glass," observes Fred Carrigg, the executive director for academic programs for the Union City board of education. ``It's not like the ghetto. People here still believe in the American dream."

As Carrigg knows, dreams do come true in Union City.

Seven years ago, student performance over all was so dismal that the state threatened to take over the district. Today, however, the city's 11 schools and more than 8,500 students are on the upswing.

District officials proudly list their improvements: Attendance for both students and teachers is above the state average, the annual student-mobility rate has dropped from 44 percent to 22 percent (only 12 percent at Christopher Columbus Middle School), and elementary school students are exceeding state and national test norms.

Observers, including U.S. Secretary of Education Richard W. Riley, regularly visit Christopher Columbus to see how this poor, overwhelmingly Hispanic community resurrected itself to become an innovator of systemic reform. Riley often touts the program as an example of how technology can help improve student performance.

But the changes in Union City are the result of more than just a technological fix. The reform effort began in earnest during the summer of 1989 when Carrigg set in motion a restructuring of the entire system. Central to that effort was a shift from traditional textbook-based instruction to a whole-language curriculum.

Rather than buy textbooks for each student, the district bought a limited number of a variety of textbooks for students to share and compare information. At the same time, Union City decided to invest heavily in updating the district's computer laboratories, purchasing 775 Macintosh computers between 1990 and 1994, bringing the student-computer ratio to 11 to 1, far better than average in the state.

In addition, the school day was restructured into blocks of time, student learning became cooperative, classes were redesigned to be cross-curricular, and teachers were encouraged to ACT more like coaches.

Funding for the restructuring came from several sources. In 1988, voters in the municipality passed a $27 million bond issue to renovate antiquated schools. In 1990, the state passed the Quality Education Act, which authorized the transfer of funds from wealthier districts to poor districts like Union City. Due to changes in eligibility requirements, Union City also became eligible for federal Title I funds.

Carrigg notes that as students and parents have become more engaged in their schools, vandalism has plummeted, freeing up millions of dollars that have been plowed into expanding the district's technology.

In 1992, Bell Atlantic chose Union City for its technology trial. The corporate outreach was partly in response to the passage of the 1992 Telecommunications ACT of New Jersey. The legislation provided the catalyst for this initiative by creating financial and regulatory incentives to disseminate advanced technology, particularly in schools, says Rahman Karriemn, who oversaw the project's second year for Bell Atlantic.

Eager for corporate partners, district officials welcomed the experiment. Coincidentally, the district had recently bought an old parochial school it planned to convert into Christopher Columbus Middle School. Bell Atlantic technicians were able to

wire the school, and its opening in September 1993 coincided with the trial's launch.

Bell Atlantic will not reveal how much has been spent on the project, but ``it has involved significant resources--in the millions," says Tully, the project's manager.

It is important that educators keep this trial in perspective, Carrigg says. ``Technology is a tool, not a philosophy. It facilitates something else. You can't isolate it--it's meaningless unless it's integrated into the curriculum."

His colleagues at Bell Atlantic agree. ``You can't throw technology against the wall and expect it to stick," says Karriemn, who oversaw the trial in 1994. ``You have to develop the skills of individuals in the schools in order to make it work."

Customized Resources

Another way the district tries to strengthen the home-school connection is through Parent University, a collection of workshops designed to help parents develop better life and job skills. Several afternoons a week, parents come to Christopher Columbus to learn how to use computers and basic software. While their parents master the basics, students work nearby on homework assignments or group research projects.

In addition, over the next three years, the Bell Atlantic technology at Christopher Columbus will be disseminated to Union City's other schools thanks to a $1.5 million grant from the National Science Foundation.

It is critical for the school district to become technologically self-sufficient, says Margaret Honey, the associate director at the New York-based Center for Children and Technology, which helped Union City secure the grant.

``When a large corporation says it's going to hook 10,000 schools up to the Internet, that's great," she says. ``But what does it mean? The superhighway is not about content--it's about promoting ownership, where educators are defining the resources that are relevant to their classrooms."

Technological independence may not be too far off for Union City. Carrigg is working with Lotus Notes to design an on-line curriculum repository that will allow teachers and administrators to exchange teaching ideas, discuss curricular changes, and communicate about other professional issues.

Nationwide, Tully predicts that Bell Atlantic's networking technology should be available well within the decade. The potential school market is estimated to be worth billions of dollars.

When and if these products actually become available depends to some degree on the complex legislation now wending its way through Congress. Conferees are weighing House and Senate versions of deregulation, and one outstanding question is whether schools will be guaranteed affordable, discounted access to telecommunications services.

Robert Fazio, the principal at Christopher Columbus, is keeping his fingers crossed that this will become a reality. ``I hope this school will be replicated in every district and state in the country," he says. ``I want every school to experience what we have. This is education."

The resources mentioned in this story can be reached at the following Internet address:
Bell Atlantic New Jersey: http://www.cnm.bell-atl.com/pfischer/explore.html.

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Making It Work

By Peter West

In the beginning was the idea.

For administrators at the Laurel Springs School, a private K-12 school in Ojai, Calif., 90 minutes' drive north of Los Angeles, the idea was to make an entire precollegiate curriculum available on the Internet so that students could study from home--whether home was in Tulsa or Thailand.

But between the idea and the execution lay the details. And the many technical, logistical, and human problems Laurel Springs encountered in linking home and school by technology are far from unique to that school.

Paper-and-pencil correspondence courses had long been a fixture of the school's curriculum, and electronic communications were expected to provide additional dimensions to learning.

But teaching whole courses on the Internet is a radical idea even for a private school that espouses a fairly unusual educational philosophy: All of its students are on independent-study programs of their own choosing. And many of them live outside California.

Marilyn Mosley, the school's director, says the Internet course was designed to meet several goals. One was to link electronically a student body that spans the globe. Another was to supplement the few reference materials often found in local libraries. A third was to help prepare students for a world that depends on technology.

The lessons Laurel Springs learned in implementing the pilot course for 40 students are broadly applicable to any effort to link school and home through telecommunications.

First, ``virtual courses'' are a valuable supplement to, not a

replacement for, traditional learning. Although it is possible, ``we certainly don't advocate all on-line learning," Mosley says.

The school also found that parent support was critical. Parents need to be taught such basics as how to get on line or how to get their modems to work. ``What we did for our parents was allow them to enroll in a course called Introduction to the Internet," Mosley explains. ``At first, we only opened it up to our students, but then we had a number of moms say, `Well, we'd like to take that, too.' "

Getting teachers on line and helping them to incorporate the technology into their teaching was also important. ``Many of them said, `It'll cost me too much money in on-line fees' or `I'm not ready yet because it's going to take too much of our time,' " Mosley explains.

Teachers also benefited from taking the introductory Internet course, she says. And teachers were asked to help design the on-line courses.

The school also had to come to grips with technological realities.

Lee Gordanier, the school's technology administrator, says that schools considering such an initiative must ensure that home equipment is up-to-date. ``Anything more than a couple of years old just isn't capable of interacting with these incredible new languages that are out there on the Internet," he says.

The school also has a contract with a private provider of Internet access because students rapidly use up basic time on commercial on-line services, he adds. The provider also can screen out sexually explicit materials available on line.

Finally, the educators had to deal with the constantly changing nature of the Internet. Resources that might be found at one electronic address one day may well be somewhere else the next, often without any warning. ``It's not like creating a curriculum from a book," Mosley notes. ``There's a fluidity to the World Wide Web that's exciting but kind of frustrating."

Public School Problems

Some stereotypes about computer-based instruction also have fallen by the wayside at Laurel Springs. For example, books are often, but not always, superior to electronic media as teaching tools. ``There are many children who learn better on line, particularly some young boys," Mosley contends.

And girls are not necessarily adverse to technology. ``I found that girls don't like to `surf the net'; they don't like to hang out in front of the computer and play," Mosley says. ``But they're much more purpose-oriented than boys. They have more of a focus, and they'll use it as a tool."

Moreover, conventional wisdom dictates that today's students have vastly more experience with computers than their teachers. That's not always true, Mosley says. ``We get kids who were in public high schools and many of them have had little time at a computer lab in their school," she says.

Public school administrators face some additional difficulties in developing electronic school-to-home connections. Unlike at Laurel Springs, where students own their computers, public schools usually furnish equipment, raising questions of liability should the machine be lost, stolen, or damaged.

The Crown Point, Ind., School Corp. provides every 4th and 5th grader with a home computer as part of the statewide Buddy Project. Jeff Iacobazzi, the executive assistant to the superintendent, says the best way to deal with such issues is to adapt existing policies on school-supplied uniforms or band instruments, which often are covered by homeowner's insurance policies. Still, he adds, no policy addresses every eventuality.

``We had a problem where a truck crashed into a house and destroyed the computer," he says. ``That provoked a hissing contest between the homeowners and the auto-insurance companies."

And when a household cat so severely soiled a computer keyboard that it could not be recycled to another family, he jokes, the incident ``fell into the category of `an act of God.' "

The resources mentioned in this story can be reached at the following Internet address:
Laurel Springs School: http://www.Laurelsprings.com.

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Equitable Pursuits

By Peter West

Elsie Crum leans close to a fresh-from-the-box personal computer and points with pride at the small metal tag that identifies it as an Urban Technology Center machine.

It isn't a brand that you'll find in any retail store. And that's exactly the point.

With the help of corporate donations, inventive finance plans, and the collective marketing savvy of its backers, the nonprofit Urban Technology Center hopes to make its brand of new and reconditioned computers at least as affordable for inner-city residents as television sets.

By providing low-cost access to information technologies, and training in how to use them, the center hopes to furnish poor people with increasingly vital electronic links from their homes to community services, public schools, and new economic opportunities.

``We don't want the computer to become a glorified typewriter,'' says Crum, a Harvard-trained lawyer and one-time chief of staff to former New York Mayor David Dinkins. ``We see the most powerful application of the technology as its communications capability. It's not just using the Internet as a research tool, but using the Internet as a lifeline.''

The center is working with Concord Family Services, a green oasis amid the graffiti and chaos of the troubled Bedford-Stuyvesant neighborhood, to develop a model program in which UTC-brand computers, computer labs, training methods, and other innovations could be adopted by almost any community in the United States.

The family-services center is an arm of the Concord Baptist Church of Christ, which has served the local community for more than a century. Area residents can now use a bank of computers at the center and enroll for classes in basic

computer use. The center also offers some pilot courses in computer maintenance and other highly marketable skills.

Through an arrangement with the Central Brooklyn Federal Credit Union, which has a branch at the family-services center, even area residents without established credit can get a loan to buy a computer at a low interest rate and with extremely flexible payment, provided they enroll in a UTC course.

``We see this as the technological equivalent of affordable housing," says Crum, an executive vice president of the technology center.

Fostering Self-Reliance

The Urban Technology Center is not the only effort to bring the information age to the inner city. In South Central Los Angeles, Kent Salveson, a real-estate developer, has established technology and tutoring centers in public-housing projects he has built there. The centers are staffed by students from the University of California at Los Angeles, who teach coursesin technology and other skills. Residents can take the Educational Excellence for Children with Environmental Limitations programs free of charge.

But Crum believes the UTC approach is unusual because it attempts to foster both self-reliance and economic development, tapping into a wellspring of community pride that causes residents to post signs in their yards that read, ``Help us to keep our block clean."

Joseph Placide, Concord's liaison to the technology center, explains that the involvement of community institutions is an important symbol for residents who too often have seen fly-by-night economic-development schemes come and go.

The technology center, meanwhile, is working with the American Telephone and Telegraph Co. to develop electronic links with a local public school that would allow students, parents, and teachers to communicate.

But even without a direct connection to schools, Crum hopes that the training and equipment her organization supplies will fill a gap that New York public schools, like those in most urban areas, are unable to meet because they lack the equipment and staff.

``Forty-five minutes of access to computers once a week is not enough. You'll never learn to play the piano if you can't practice at home," she says, drawing on personal experience. ``Which is why we're stressing the importance of having the computers in the homes."

Placide stresses that placing computers in homes also provides stability to many urban youngsters, particularly the children in Concord's comprehensive foster-child program.

``The idea is to create a support structure in the home," he says. ``The computer is not a parent. It's not a substitute for a parent. But it can become a stationary and accessible learning tool."

The resources mentioned in this story can be reached at the following Internet addresses:
ATT Learning Network: http://www.att.com/education/learning network;
Urban Technology Center: http://urbantech.inter.net/urbantech.